

**IGCSE Biology**

**Paper 4**

**Unsolved Topical**

**Past Papers with Marking Schemes**

**All Variants**

**2014-2021**

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## **Preface**

Excellence in learning can't be claimed without application of concepts in a certain context. In this regard one of the perfect approach is to start logically in chunks; like chapter wise learning and applying it on exam based questions.

This booklet provides an opportunity for practice of exam based questions which has been classified on the basis of syllabus topics and more precisely on teacher's recommendation basis. Extensive working of Team MS Books has tried to take this booklet to perfection by:

- Removing all the repeated questions but added their references at relevant places.
- Keeping all the question in a hierarchy from early years to most recent years.
- Adding Answering Key / Marks Scheme at the end of each topic.
- Maintaining actual spacing between consecutive questions and within options as per CIE format which gives students a more realistic feel of attempting question.

In addition to all this; review, feedback and contribution in this booklet by various competent teaches of subject belonging to renowned school chains make it most valuable resource and tool for both teachers and students. With all believes in strengths of this resource material I can confidently claim its worth in achieving brilliance.

**Subject Head**

**Muhammad Shahid**

**0334-4463339**

M.Phil (FSQM), B.S (Biology), B.S.Ed  
(Education) Biology Teacher at SLC (SICAS  
Liberty Complex)

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## Characteristics and Classification of Living Organisms

Q5(a,b)/31/M/J/14

1 Fig. 5.1 shows the nematode, *Caenorhabditis elegans*.



**Fig. 5.1**

(a) (i) State the genus of this nematode.

.....[1]

(ii) State two **structural** features of nematodes.

1 .....

2 .....

[2]

(b) Nematodes feed on dead and decaying material. Explain why this gives nematodes an important role in ecosystems.

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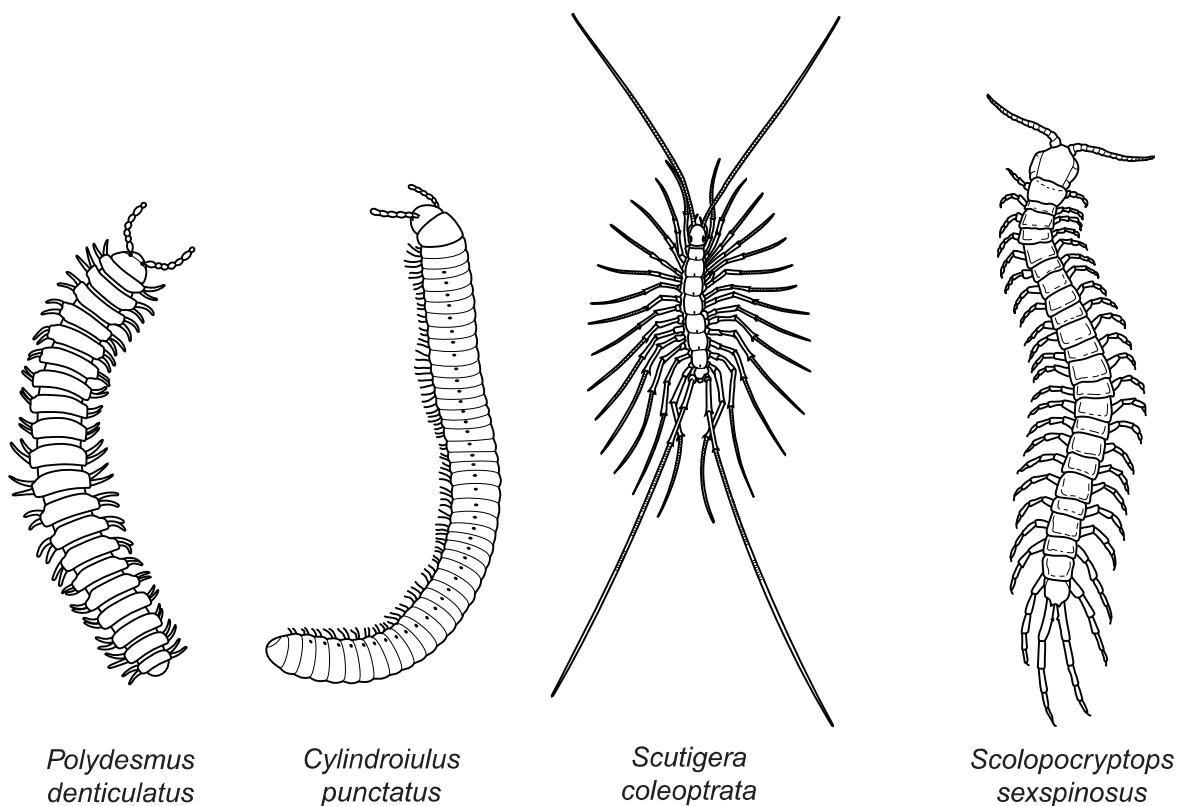
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[3]

Q6(a,b,c)/32/M/J/14

- 2 Myriapods are a group of arthropods that are commonly found in soil habitats in many parts of the world. Many myriapods are very small and not easy to identify.

Fig. 6.1 shows four species of myriapod, not drawn to the same scale.



**Fig. 6.1**

- (a) State **three** features of **all** myriapods that are visible in Fig. 6.1.

1 .....

2 .....

3 ..... [3]

- (b) Describe **three** features of myriapods that could be used to make a dichotomous key to distinguish between the four species in Fig. 6.1.

1 .....

.....

2 .....

.....

3 .....

..... [3]

Mitochondria are cell structures that contain a small quantity of DNA.

- (c) Scientists are sequencing the DNA of one particular gene in mitochondria to help identify different species of many animals including myriapods. The sequences that they find are called 'barcodes'.

- (i) State the part of the cell that contains most of the DNA.

..... [1]

- (ii) Suggest how DNA barcoding might be useful in the conservation of animals, such as myriapods.

.....

.....

.....

.....

..... [2]

- (iii) State the function of DNA in cells.

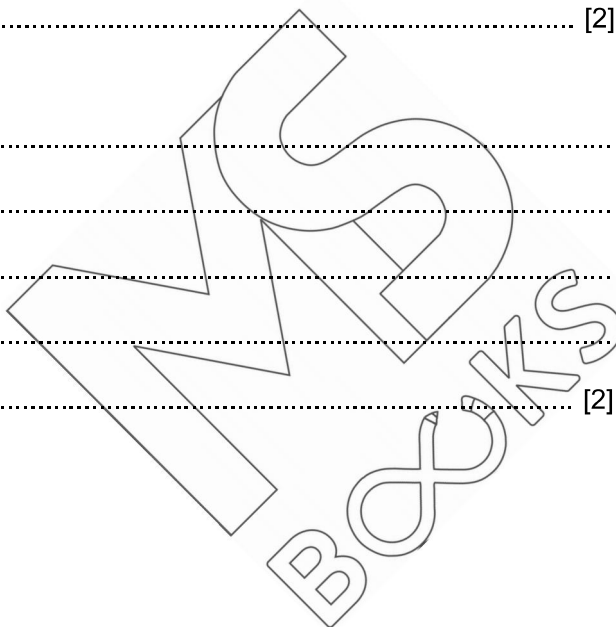
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..... [2]



Q1/31/M/J/15

3 (a) Fig. 1.1 shows five species of mollusc.

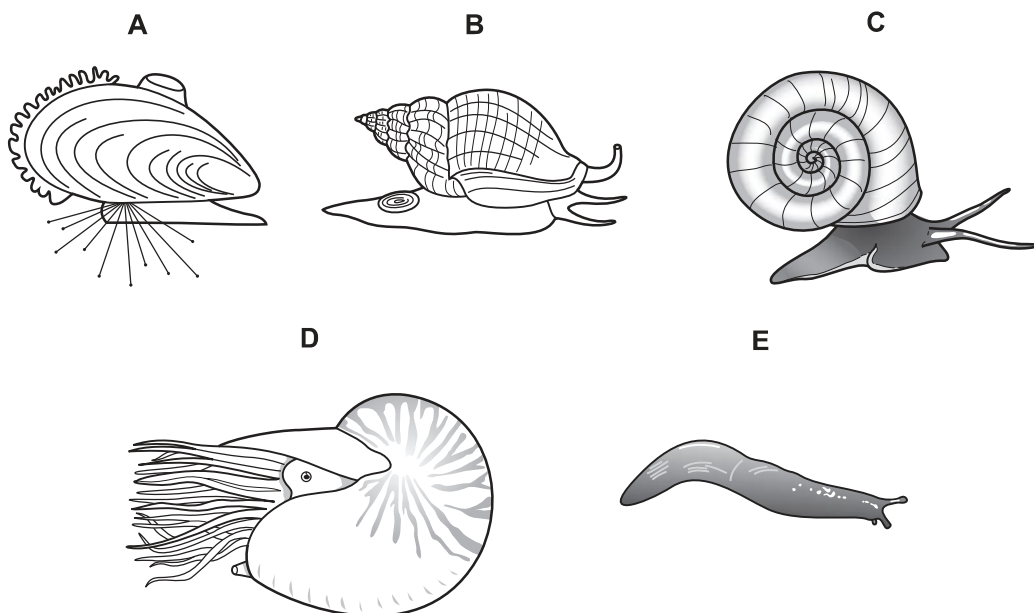


Fig. 1.1

Use the key to identify each species. Write the letter of each species (A to E) in the correct box beside the key.

Key

1 (a)	body is completely or partly covered in a shell	go to 2	
(b)	body is not completely covered or partly covered in a shell	<i>Limax flavus</i>	
2 (a)	shell is attached to rocks by thin threads	<i>Mytilus edulis</i>	
(b)	shell is not attached to rocks by thin threads	go to 3	
3 (a)	shell is a spire that comes to a point	<i>Buccinum undatum</i>	
(b)	shell is not a spire that comes to a point	go to 4	
4 (a)	animal has tentacles	<i>Nautilus pompilius</i>	
(b)	animal has 2 tentacles	<i>Planorbis planorbis</i>	

[3]

(b) State **two** features that are shown by all molluscs.

1 .....

2 .....

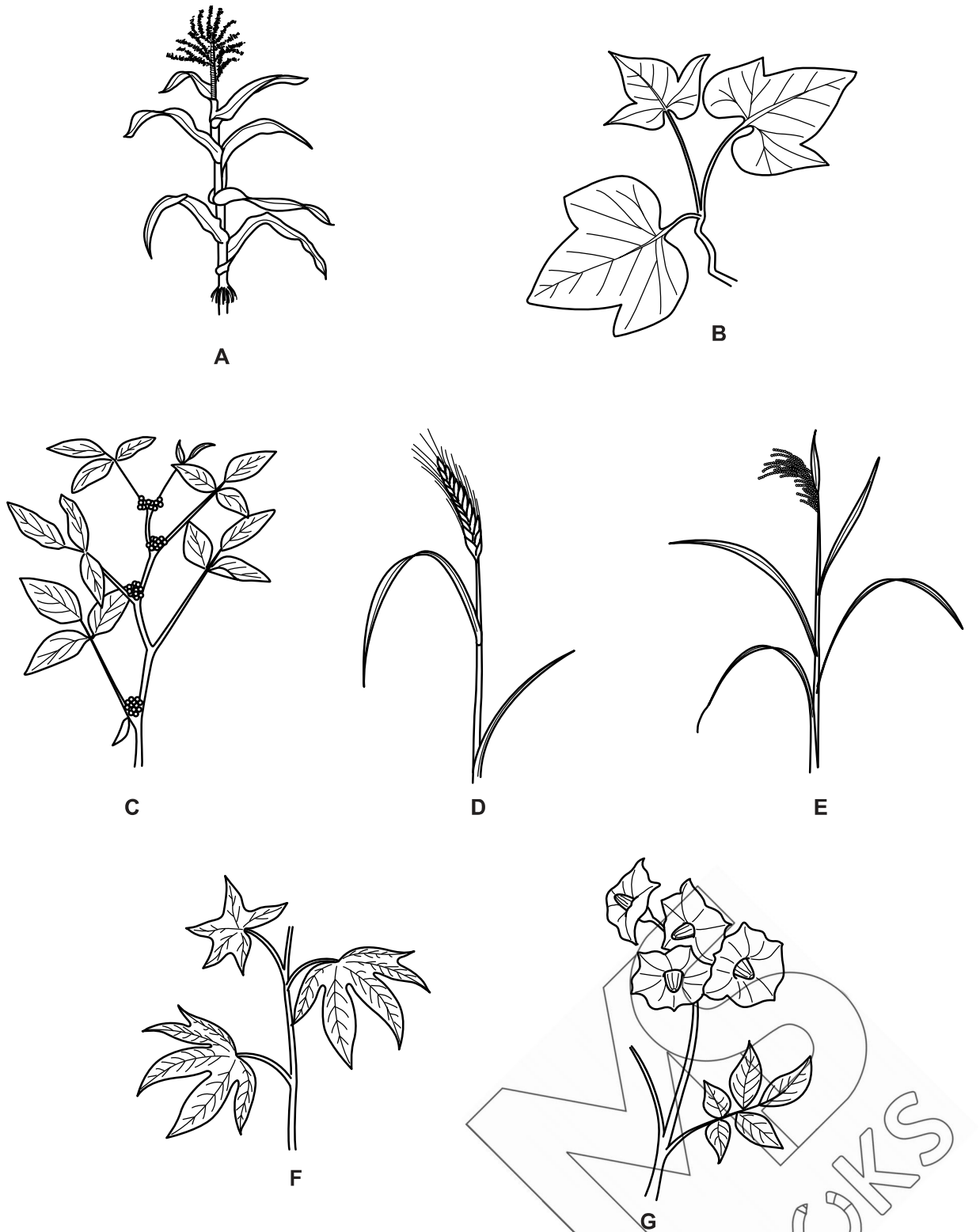
[2]

[Total: 5]



Q1(a,b)/32/M/J/15

**4 (a)** Fig. 1.1 shows seven plant species that are important crops.



not drawn to scale

**Fig. 1.1**

Use the key to identify each species. Write the letter of each species (**A** to **G**) in the correct box beside the key. One has been done for you.

**Key**

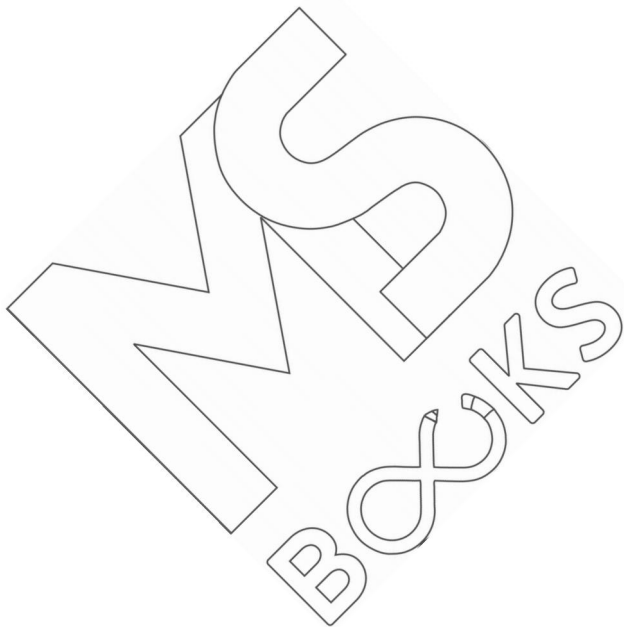
1 (a)	branched veins on leaves	go to 2	
(b)	parallel veins (not branched) on leaves	go to 3	
2 (a)	leaves divided into leaflets (look like small individual leaves)	go to 4	
(b)	leaves not divided into leaflets	go to 5	
3 (a)	flowers grouped tightly together at the top of the stalk	<i>Triticum aestivum</i>	
(b)	flowers grouped loosely together at the top of the stalk	go to 6	
4 (a)	large flowers located at top of stem	<i>Solanum tuberosum</i>	
(b)	small flowers located along the stem	<i>Glycine max</i>	
5 (a)	leaves have five lobes	<i>Manihot esculenta</i>	<b>F</b>
(b)	leaves have three lobes	<i>Ipomoea batatas</i>	
6 (a)	flowers above youngest leaf	<i>Zea mays</i>	
(b)	flowers bend down below youngest leaf	<i>Oryza sativa</i>	

[3]

- (b) The pattern of the veins on the leaves was used in the key to separate the monocotyledonous crop plants and eudicotyledonous (dicotyledonous) crop plants shown in Fig. 1.1.

State **one** other feature that could be used to identify monocotyledonous plants from eudicotyledonous plants.

..... [1]



Q 1 (a,b)/31/M/J/14

(a) (i)	<i>Caenorhabditis</i> ;	[1]	
(ii)	thread-like bodies / filamentous / filament-like ; unsegmented body ; hydrostatic skeleton ; body, tapers / is pointed, at, one / both, ends ; through gut / mouth and anus ; relatively large pharynx / sucking mouthparts ;	max [2]	
(b)	prevents accumulation of dead matter / removes (organic) waste ; recycles nutrients / named nutrient(s) ; releases (carbon as) carbon dioxide ; (carbon dioxide) for photosynthesis ; decreases particle size of food for decomposers ; ref to energy flow in, food chain / food web / ecosystem ;	max [3]	<b>R</b> energy cycling / recycling

Q6(a,b,c)/32/M/J/14 Q 2

6 (a)	<p>1 antennae ;</p> <p>2 elongated bodies ;</p> <p>3 <u>segmented</u> body / many <u>segments</u> ;</p> <p>4 many (<math>\geq 10</math>) legs ;</p> <p>5 (one or two pairs of) legs on each segment ;</p> <p>6 exoskeleton ;</p> <p>7 <u>jointed</u> legs ;</p>	max [3]	
(b)	<p>1 length of antennae ;</p> <p>2 number of sections on antennae ;</p> <p>3 presence / absence, of tail pieces / AW ;</p> <p>4 length of tail pieces ;</p> <p>5 length of legs ;</p> <p>6 number of leg joints ;</p> <p>7 total number of legs ;</p> <p>8 position of legs on body ;</p> <p>9 number of legs per segment ;</p> <p>10 size / shape of segments ;</p> <p>11 number of body segments ;</p> <p>12 length of body ;</p> <p>13 head shape ;</p> <p>14 presence / absence 'spots / markings' ;</p>	max [3]	
(c) (i)	nucleus ;	[1]	<b>Ignore</b> chromosomes
(ii)	<p>1 <i>idea that animals are identified accurately</i> ; <b>R</b> identify unqualified</p> <p>2 barcoding is, cheap / easy / quick / efficient ;</p> <p>3 barcoding is useful if distinguishing characteristics / dichotomous key are difficult ;</p> <p>4 identify previously unknown species ;</p> <p>5 helps to identify, threatened / endangered species ;</p>	max [2]	
(iii)	<p>1 ref to genes ;</p> <p>2 codes for (specific) proteins ;</p> <p>3 stores genetic information ;</p> <p>4 can be copied to pass on information to new cells ;</p>	max [2]	

Q1/31/M/J/15 Q 3

Question	Expected Answers	Marks	Additional Guidance
1 (a)	E A B D C	[max 3]	all 5 correct = 3 marks 3/4 correct = 2 marks 1/2 correct = 1 mark
(b)	soft body ; not segmented ; mantle ; visceral mass ; (muscular) foot ; <b>ignore</b> feet / legs produce slime / have slimy body ; <b>A</b> mucus radula / rasping tongue / AW ; hydrostatic skeleton ;	[max 2]	
		[Total: 5]	

Q1(a,b)/32/M/J/15 Q 4

Question	Expected Answers		Marks	Additional Guidance																								
1 (a)	<table><tr><td><i>Triticum aestivum</i></td><td>D</td></tr><tr><td><i>Solanum tuberosum</i></td><td>G</td></tr><tr><td><i>Glycine max</i></td><td>C</td></tr><tr><td><i>Manihot esculenta</i></td><td>F</td></tr><tr><td><i>Ipomoea batatas</i></td><td>B</td></tr><tr><td><i>Zea mays</i></td><td>A</td></tr><tr><td><i>Oryza sativa</i></td><td>E</td></tr></table>		<i>Triticum aestivum</i>	D	<i>Solanum tuberosum</i>	G	<i>Glycine max</i>	C	<i>Manihot esculenta</i>	F	<i>Ipomoea batatas</i>	B	<i>Zea mays</i>	A	<i>Oryza sativa</i>	E	max [3]	5/6 right = 3 3/4 right = 2 1/2 right = 1 0 right = 0										
<i>Triticum aestivum</i>	D																											
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(b)	<table><tr><td>1</td><td>general features:</td></tr><tr><td>2</td><td>leaf, width / shape ;</td></tr><tr><td>3</td><td>leaf connection to stem / AW ;</td></tr><tr><td>4</td><td>number of (named) flower parts ;</td></tr><tr><td>5</td><td>number of, cotyledons / seed leaves ;</td></tr><tr><td>6</td><td>type of root ;</td></tr><tr><td>7</td><td>pattern of vascular bundles ;</td></tr><tr><td>8</td><td>presence/absence of cambium / AW ;</td></tr></table>	1	general features:	2	leaf, width / shape ;	3	leaf connection to stem / AW ;	4	number of (named) flower parts ;	5	number of, cotyledons / seed leaves ;	6	type of root ;	7	pattern of vascular bundles ;	8	presence/absence of cambium / AW ;	<table><tr><td>monocotyledon features:</td></tr><tr><td>narrow leaves ;</td></tr><tr><td>sheath / no petiole ;</td></tr><tr><td>flower parts in multiples of 3 ;</td></tr><tr><td>one cotyledon / seed leaf ;</td></tr><tr><td>fibrous roots ;</td></tr><tr><td>scattered vascular bundles ;</td></tr><tr><td>no, cambium / woody tissue ;</td></tr></table>	monocotyledon features:	narrow leaves ;	sheath / no petiole ;	flower parts in multiples of 3 ;	one cotyledon / seed leaf ;	fibrous roots ;	scattered vascular bundles ;	no, cambium / woody tissue ;	max [1]	Mark answers in context of either general features (first column) or referring to monocotyledonous plants (second column)
1	general features:																											
2	leaf, width / shape ;																											
3	leaf connection to stem / AW ;																											
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